LIQUID CRYSTAL DISPLAY DEVICE . . .
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FIG. 1

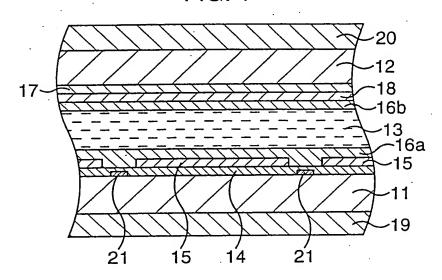


FIG. 2A

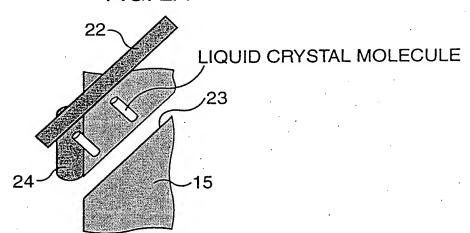


FIG. 2B

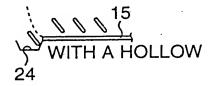


FIG. 2C

DARK LINE

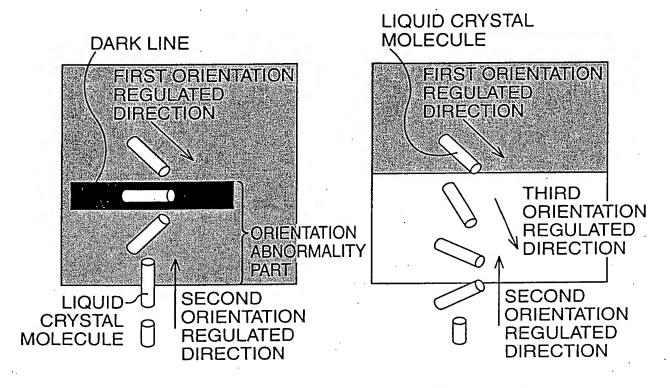
15

WITHOUT A HOLLOW

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FIG. 3A

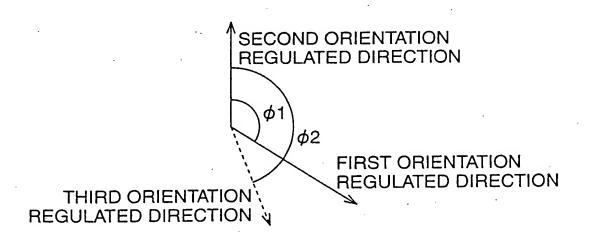
FIG. 3B



CONVENTIONAL

GIVE A THIRD REGULATING FORCE

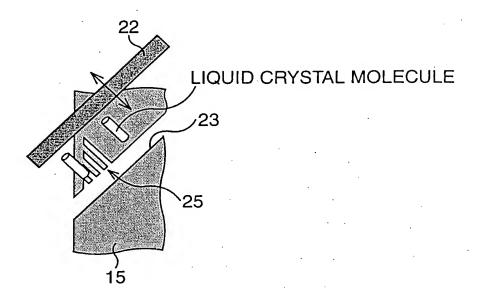
FIG. 3C



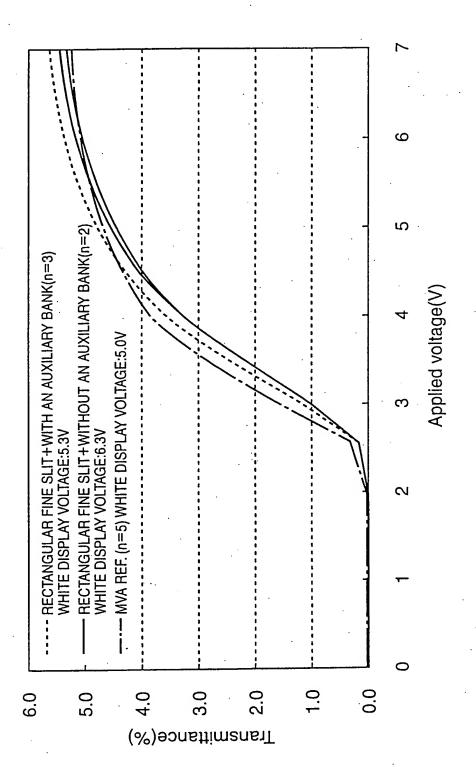
RELATION BETWEEN DIRECTIONS OF ALIGNING FORCE AND ANGLES

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FIG. 4







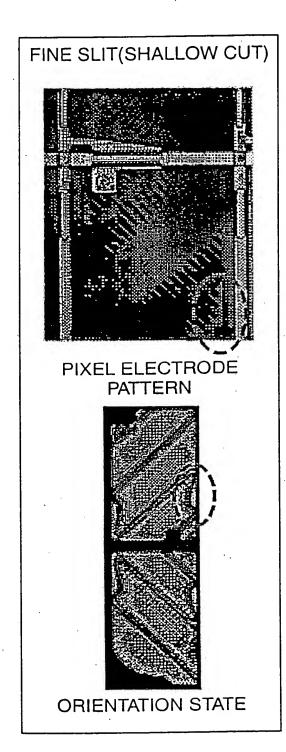
LIQUID CRYSTAL DISPLAY DEVICE . . . Takeda et al. Greer, Burns & Crain, Ltd. (Patrick Burns) Ref. No. 1117.68337 Sheet 5 of 27 (312) 360 0080

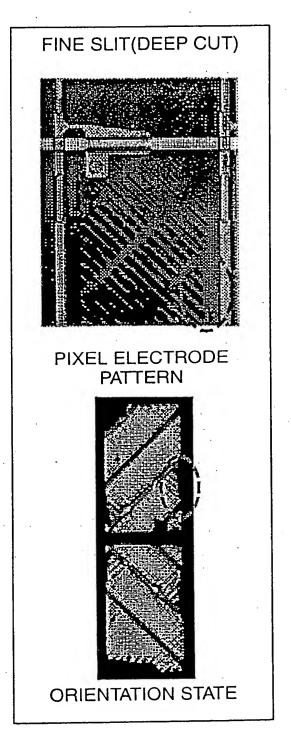
FIG. 6B FIG. 6C FIG. 6A APPLIED **APPLIED APPLIED VOLTAGE: 4V VOLTAGE:5V VOLTAGE: 3V** FIG. 6F FIG. 6E FIG. 6D

APPLIED APPLIED VOLTAGE: 8V

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FIG. 7





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FIG. 8

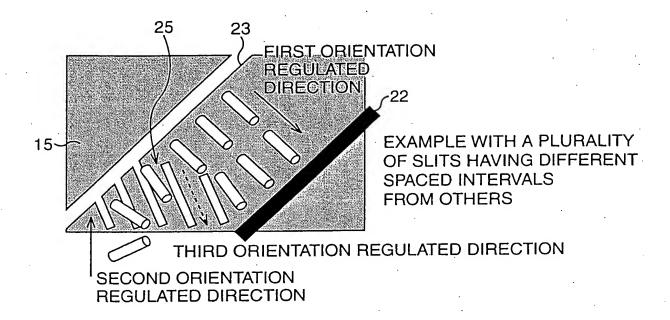
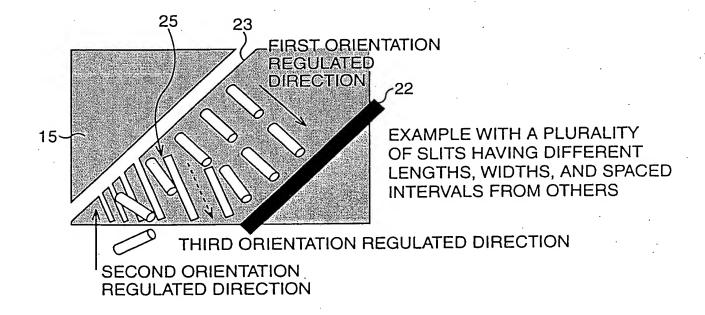
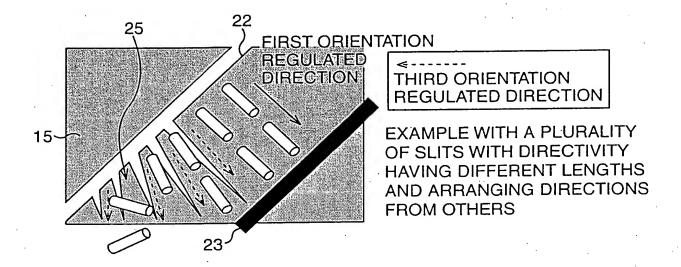


FIG. 9



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FIG. 10



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FIG. 11

·	①WITH AN AUXILIARY BANK	②WITHOUT AN AUXILIARY BANK	③CHANGE THE DIRECTION OF AN AUXILIARY BANK
STRUCTURE	PROTRUSION OF SUBSTRATE PIXEL ELECTRODE ON TETT SUBSTRATE	DARK LINE	
TRANSMITTANCE	1	0.9	0.95
MISALIGNMENT MARGIN	×	0	Δ
FEATURES	·LIQUID CRYSTAL ORIENTATION OF A PIXEL EDGE CHANGES GREATLY DUE TO DEVIATION AMONG EACH SHOT AND IN PASTING (A LARGE DEGREE OF TRANSMITTANCE CHANGE) ·NO DARK LINE ON A PIXEL EDGE (A LARGE DEGREE OF IMPROVEMENT IN TRANSMITTANCE)	·LIQUID CRYSTAL ORIENTATION OF A PIXEL EDGE CHANGES DUE TO DEVIATION AMONG EACH SHOT AND IN PASTING (TO A SMALL DEGREE) ·OCCURRENCE OF ONE DARK LINE ON A PIXEL EDGE (A LARGE DEGREE OF DECREASE IN TRANSMITTANCE)	·LIQUED CRYSTAL ORIENTATION OF A PIXEL EDGE CHANGES DUE TO DEVIATION AMONG EACH SHOT AND IN PASTING ·NO DARK LINE ON A PIXEL EDGE

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FIG. 12

	4 HOLLOW IN A PIXEL EDGE	⑤FINE SLITS +CONNECTION AT THE END
STRUCTURE	HOLLOW	CONNECTION
TRANSMITTANCE	0.92	0.95
MISALIGNMENT MARGIN	0	©
FEATURES	·LIQUID CRYSTAL ORIENTATION OF A PIXEL EDGE CHANGES DUE TO DEVIATION AMONG EACH SHOT AND IN PASTING (WITH A MARGIN) ·NO DARK LINE ON A PIXEL EDGE	·LIQUID CRYSTAL ORIENTATION DOES NOT CHANGE EASILY DUE TO DEVIATION AMONG EACH SHOT AND IN PASTING (WITH THE LARGEST MARGIN) ·NO DARK LINE AT A PIXEL EDGE (TRANSMITTANCE UNDER IMPROVEMENT) ·TRANSMITTANCE IS IMPROVED GREATLY AT A DRIVING VOLTAGE OF 6V OR HIGHER (EQUAL TO ①)

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FIG. 13

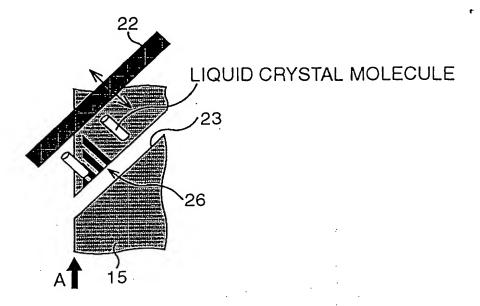


FIG. 14A

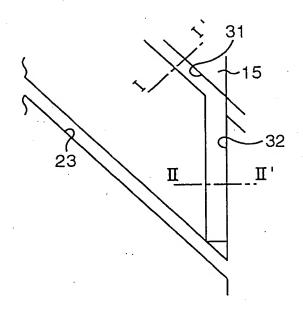
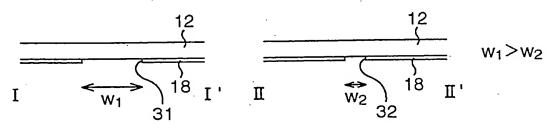


FIG. 14B



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FIG. 15A

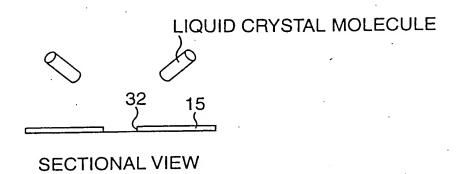
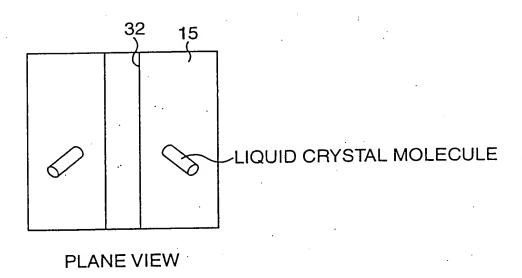


FIG. 15B



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FIG. 16A

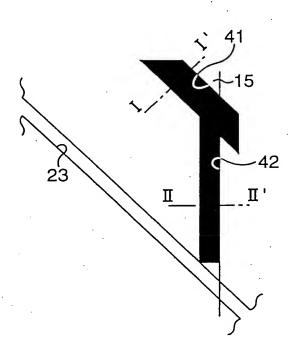
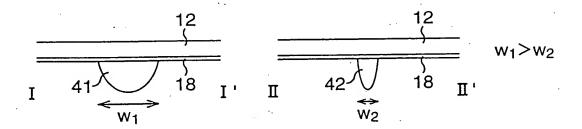


FIG. 16B



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FIG. 17A

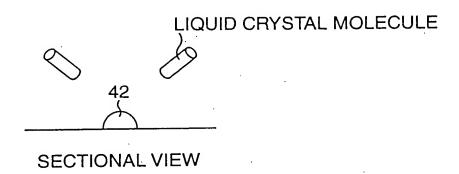
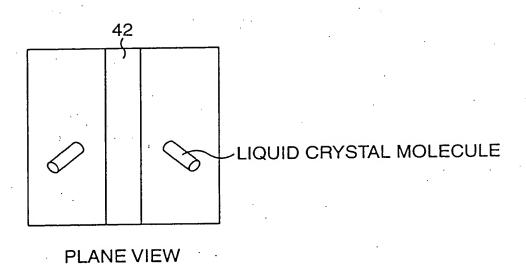
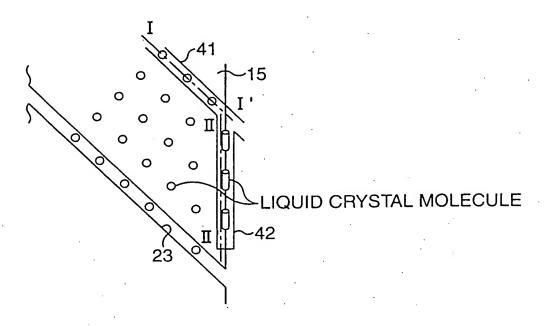


FIG. 17B



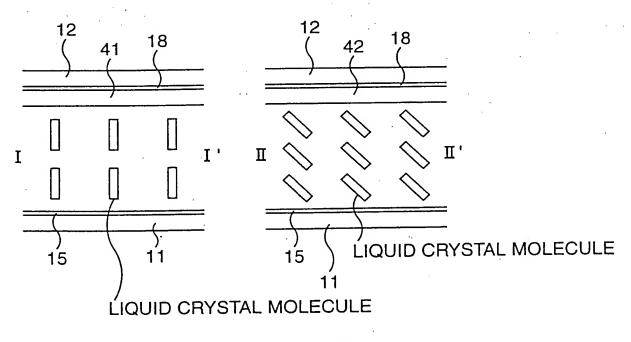
LIQUID CRYSTAL DISPLAY DEVICE . . . Takeda et al. Greer, Burns & Crain, Ltd. (Patrick Burns) Ref. No. 1117.68337 Sheet 15 of 27 (312) 360 0080

FIG. 18A



PLANE VIEW

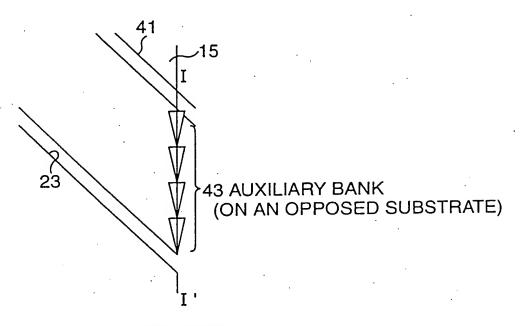
FIG. 18B



SECTIONAL VIEW

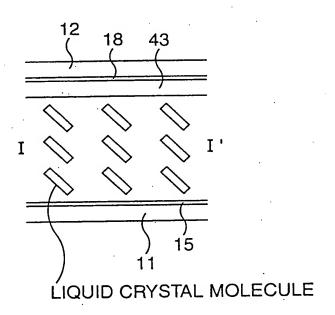
LIQUID CRYSTAL DISPLAY DEVICE . . . Takeda et al. Greer, Burns & Crain, Ltd. (Patrick Burns) Ref. No. 1117.68337 Sheet 16 of 27 (312) 360 0080

FIG. 19A



PLANE VIEW

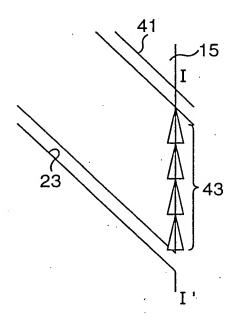
FIG. 19B



SECTIONAL VIEW

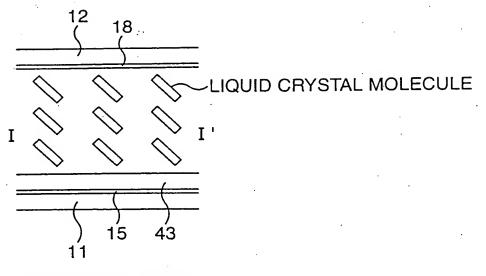
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FIG. 20A



PLANE VIEW

FIG. 20B



SECTIONAL VIEW

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FIG. 21A

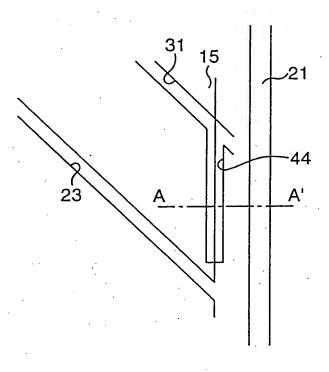
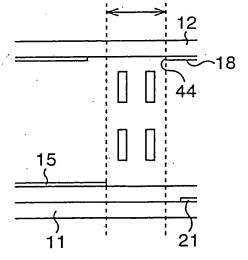


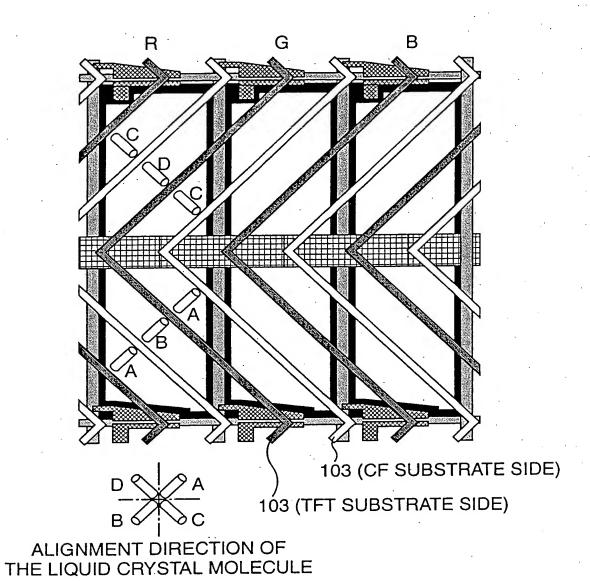
FIG. 21B

A REGION WITH NO ELECTRODE ON BOTH OF THE SUBSTRATES



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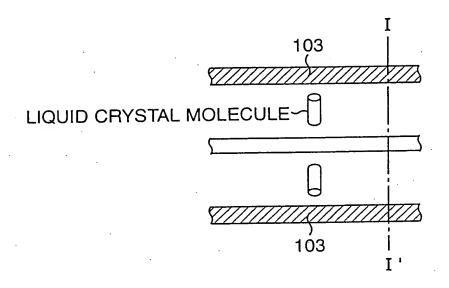
FIG. 22



PIXEL STRUCTURE OF AN MVA LIQUID CRYSTAL DISPLAY (ONE PIXEL)

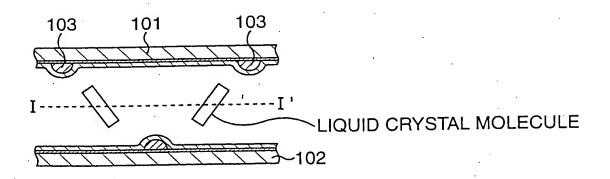
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FIG. 23A



PLANE VIEW

FIG. 23B



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FIG. 24A

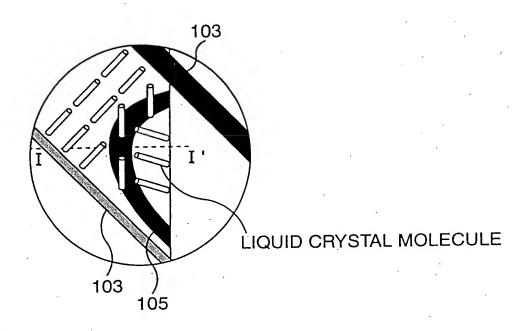
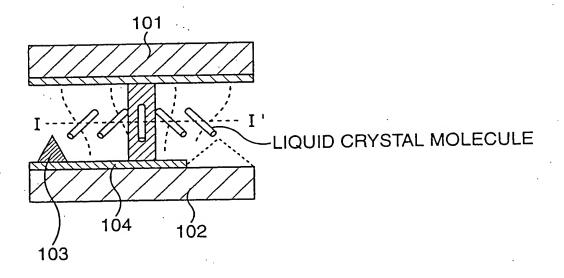
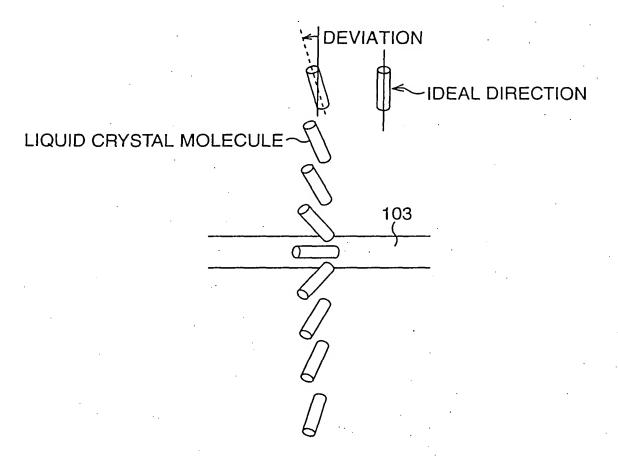


FIG. 24B



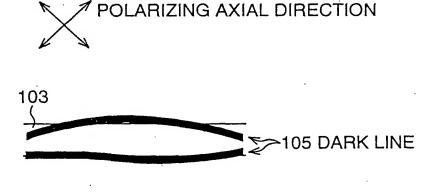
LIQUID CRYSTAL DISPLAY DEVICE . . . Takeda et al. Greer, Burns & Crain, Ltd. (Patrick Burns) Ref. No. 1117.68337 Sheet 22 of 27 (312) 360 0080

FIG. 25A



ALIGNMENT DIRECTION OF THE LIQUID CRYSTAL MOLECULE

FIG. 25B



OPTICAL APPEARANCE

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FIG. 26A

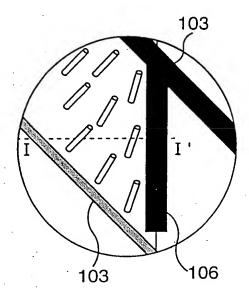
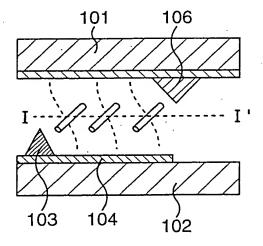


FIG. 26B



LIQUID CRYSTAL DISPLAY DEVICE . . . Takeda et al. Greer, Burns & Crain, Ltd. (Patrick Burns) Ref. No. 1117.68337 Sheet 24 of 27 (312) 360 0080

FIG. 27A

EDGE OF A PIXEL ELECTRODE

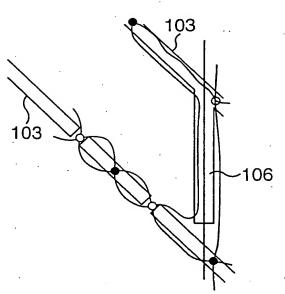
103

- SINGULAR POINTS OF S=-1 ORIENTATION VECTOR
- SINGULAR POINTS OF S =+1 ORIENTATION VECTOR



WITHOUT AN AUXILIARY BANK

FIG. 27B



103

WITH AN AUXILIARY BANK

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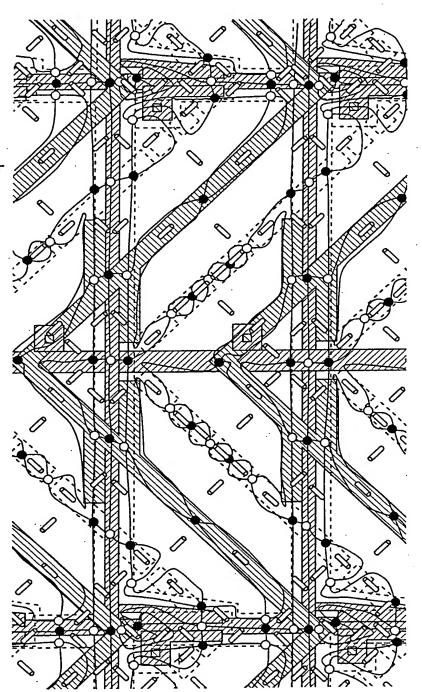
FIG. 28

STRENGTH OF SINGULAR POINTS OF ORIENTATION VECTOR

●S=+1

OS=-1

OBSERVED WITH A TFT SUBSTRATE ON A LOWER SIDE AND A CF SUBSTRATE ON AN UPPER SIDE



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FIG. 29A

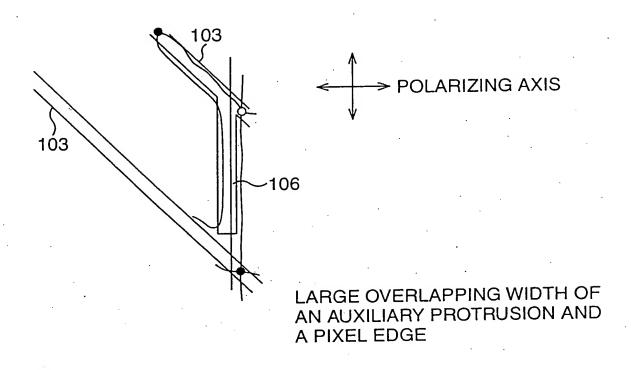
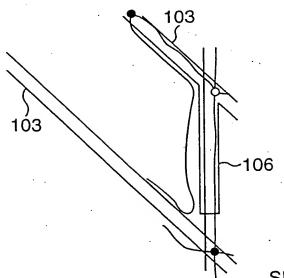
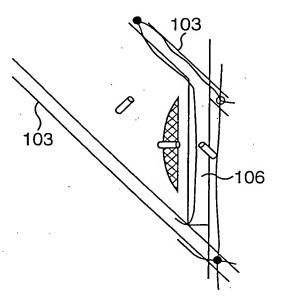


FIG. 29B



SMALL OVERLAPPING WIDTH OF AN AUXILIARY PROTRUSION AND A PIXEL EDGE LIQUID CRYSTAL DISPLAY DEVICE . . . Takeda et al. Greer, Burns & Crain, Ltd. (Patrick Burns) Ref. No. 1117.68337 Sheet 27 of 27 (312) 360 0080

FIG. 30





LARGE OVERLAPPING WIDTH OF AN AUXILIARY BANK AND A PIXEL (LARGER THAN THAT OF UPPER CASES SHOWN IN FIG.7)